

**Before the  
FEDERAL COMMUNICATIONS COMMISSION  
Washington, D.C. 20554**

In the Matter of	)	
	)	
Revision of Part 15 of the Commission's	)	ET Docket 98-153
Rules Regarding Ultra-Wideband	)	
Transmission Systems	)	

**COMMENTS OF AT&T WIRELESS SERVICES, INC.  
ON PETITIONS FOR RECONSIDERATION**

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AT&T Wireless Services, Inc. ("AWS"), pursuant to 47 C.F.R. § 1.106(g) and the Commission's Public Notice of July 16, 2002,<sup>1/</sup> hereby submits its comments in partial support of and partial opposition to the petitions for reconsideration of the Commission's First Report and Order in the above-referenced proceeding.<sup>2/</sup>

**INTRODUCTION AND SUMMARY**

The petitions for reconsideration of Sprint, Cingular, and others clearly demonstrate that the limits on UWB emissions in the PCS band established by the Commission are insufficient to protect existing licensed PCS operations. This is particularly true given that the Commission anticipates that there will be high demand for and frequent use of UWB devices following their widespread introduction into the market. Based on incorrect factual and legal premises, and failing to account for

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<sup>1/</sup> 67 Fed Reg. 46668 (July 16, 2002).

<sup>2/</sup> *Revision of Part 15 of the Commission's Rules Regarding Ultra-Wideband Transmission Systems*, First Report and Order, 17 FCC Rcd 7435 (2002) ("*First Report and Order*").

significant record evidence, the new rules for use of UWB devices are arbitrary and capricious and not the product of reasoned decisionmaking.

Because the emissions limits established for UWB device are already too lenient, the requests of Time Domain, Kohler, and others that the Commission make the limits even more permissive must be rejected. The Commission should tighten, not relax, both the standards for UWB emissions and the rules governing who is allowed to operate certain UWB devices, and must establish new rules that protect licensed operations from interference and fully account for the aggregate effects of UWB devices. Further, the Commission should -- and indeed, must under law -- allow all interested industry parties to participate in any future UWB testing in order to ensure that UWB emissions limits are established that allow for the development and use of UWB technology yet protect existing spectrum users from interference.

**I. THE UWB EMISSIONS LIMITS ARE ARBITRARY, CAPRICIOUS, AND DO NOT SUFFICIENTLY PROTECT EXISTING LICENSED SPECTRUM USERS**

Both the Commission and UWB proponents predict that UWB devices will be ubiquitously deployed in a very short time. The potential for “a vast array of new applications” and their promise of “significant benefits for Government, public safety, businesses and consumers”<sup>3/</sup> has led to predictions that UWB shortly will be a “multi-billion dollar market.”<sup>4/</sup>

It is already clear -- and indeed, the Commission has recognized<sup>5/</sup> -- that without appropriate limits on their use, UWB devices will pose a significant risk of harmful

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<sup>3/</sup> *Id.* ¶¶ 1, 4.

<sup>4/</sup> “Ultra-Wideband Near Launch,” *Washington Post* (July 6, 2002).

<sup>5/</sup> *First Report and Order* ¶ 4.

interference to existing licensed users. However, although the Commission's rules require that the emissions limits established for UWB devices prevent such harmful interference,<sup>6/</sup> the *First Report and Order* largely ignored the significant record evidence regarding potential interference to PCS operations, and designed rules for use of UWB devices based on numerous unsupported and incorrect factual and legal premises. The resulting limits are therefore arbitrary and capricious and not the product of reasoned decisionmaking.<sup>7/</sup> More importantly, they fail to protect existing licensed spectrum users.<sup>8/</sup> The rules must be revised to provide adequate protection for cellular and PCS operations,<sup>9/</sup> and the requests of Time Domain, Kohler and others to relax the limits on UWB emissions must be denied.<sup>10/</sup>

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<sup>6/</sup> See 47 C.F.R. § 15.5.

<sup>7/</sup> While AWS concentrates here on the Commission's faulty factual and legal assumptions behind the UWB emissions limits, it agrees with Sprint, Cingular, and others that the UWB rules are arbitrary, capricious, and not the product of reasoned decisionmaking because they fail to take into account record evidence that clearly contradicts the Commission's unsupported assumptions and fail to protect licensed PCS and cellular operations. See Cingular at 10-16; Sprint at 14-19, 30-35.

<sup>8/</sup> Indeed, since the Commission issued the *First Report and Order*, the National Telecommunications and Information Administration has released a final report concerning the viability of 3G systems in the 1710-1770 and 2110-2170 MHz bands. National Telecommunications and Information Administration, "An Assessment of the Viability of Accommodating Advanced Mobile Wireless (3G) Systems in the 1710-1770 MHz and 2110-2170 MHz Bands," (July 22, 2002). The report sets forth a plan for the reallocation of 90 MHz for advanced services. When this plan is implemented, the emissions limits for UWB use will need to be adjusted to account for the introduction of new advanced mobile wireless systems in those bands.

<sup>9/</sup> AWS also agrees with Multispectral Solutions that the spectrum masks provided in the *First Report and Order* are inconsistent with the Commission's rules with regard to the permissible emissions below 960 MHz. See MSSSI at 14-16. AWS joins MSSSI's request that the Commission clarify that the masks were not intended to alter the permissible emissions below 960 MHz. If the spectrum masks were intended to change the applicable emissions limits below 960 MHz, then AWS agrees with MSSSI that such a change is not supported by record evidence and was not appropriately published for notice and comment. See *id.*

<sup>10/</sup> Time Domain at 3-10; Kohler at 2-4.

**A. The UWB Limits Were Set Based on Incorrect Factual Premises.**

In establishing the limits for UWB emissions, the Commission made a number of unsupported factual assumptions that directly contradicted record evidence of real-world PCS and cellular use. The resulting limits therefore do not reflect the conditions in which PCS and cellular devices are likely to come into proximity with UWB devices, and do not sufficiently guard against the resulting interference that would occur.

**1. The Commission's assumptions about the operating signal levels used by PCS systems are incorrect.**

AWS agrees with Cingular, Sprint, and Qualcomm that the Commission's conclusions about the operating signal levels used by cellular and PCS systems do not reflect their actual real-world use.<sup>11/</sup> The Commission recognized that interference analyses for communications systems "need[] to be based on a signal to noise ratio using the signal levels actually employed by that system."<sup>12/</sup> However, despite this recognition, it agreed with an FCC Staff Report that rejected the signal level data submitted by cellular and PCS carriers as "unreasonable,"<sup>13/</sup> and instead chose to rely on an analysis of signal levels submitted by UWB proponents based on theoretical operating conditions.

The theoretical data relied on by the Commission is erroneous. PCS technology allows calls to be made based on a receiver sensitivity of -102 dBm.<sup>14/</sup> The Commission's arbitrary conclusion based on "laboratory measurements" that "a PCS received signal level of -96 dBm/1.25 MHz adequately characterizes a low level PCS

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<sup>11/</sup> See Cingular at 5-10; Sprint at 12-13; Qualcomm at 7-12.

<sup>12/</sup> See Cingular at 10, quoting FCC Staff Report, "Potential Interference to PCS from UWB Transmitters Based on Analyses by Qualcomm Incorporated" (Feb. 2002) at 4.

<sup>13/</sup> See *id.*

<sup>14/</sup> See also Qualcomm at 7-10; Sprint at 12; Cingular at 6-7.

signal based on real world applications” is incorrect.<sup>15/</sup> The Commission’s rules must be revised to reflect the actual operating signal levels of PCS systems.

**2. The Commission incorrectly assumed that cellular and PCS handsets are not likely to come into frequent proximity to UWB devices.**

The Commission’s analysis of potential interference to PCS operations was based on the completely unrealistic and unsupported assumption that “it is extremely unlikely that UWB devices will be located [close to] a PCS receiver.”<sup>16/</sup> The Commission reached a similar conclusion with regard to potential interference to cellular operations, based on the premise that imaging systems would be the only UWB devices operating in the cellular range.<sup>17/</sup>

As AWS, Sprint and others have demonstrated, however, the mobility of commercial mobile radio services makes them very likely to come into contact with UWB devices, many of which are portable and designed to be used anywhere.<sup>18/</sup> Indeed, the Commission’s own description of the most likely uses for UWB operations -- in the car (collision avoidance systems), in the home or business (short-range communications systems or simultaneous video, audio, and Internet use)<sup>19/</sup> or at construction sites (to determine the location of underground utilities, pipes or structures) -- would occur at the very places where people are likely to be using their wireless phones at close proximity.

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<sup>15/</sup> *First Report and Order* ¶ 162.

<sup>16/</sup> *Id.* ¶ 159.

<sup>17/</sup> *Id.* ¶ 192.

<sup>18/</sup> *See, e.g., In the Matter of Revision of Part 15 of the Commission’s Rules Regarding Ultra-Wideband Transmission Systems; Test Data Submitted By The NTIA Regarding Potential Interference From Ultra-Wideband Transmission Systems*, ET Docket 98-153, Comments of AT&T Wireless Services, Inc. (filed Feb. 23, 2001) at 2-3.

<sup>19/</sup> *First Report and Order* ¶ 13.

In an office environment, for example, where UWB is used to supply video or Internet capabilities to each cubicle, employees' wireless telephones would be in constant proximity to UWB devices. Emissions limits cannot be based on the premise that interference would be unlikely or infrequent, and the Commission should issue rules that reflect the likely real-world proximity of cellular and PCS handsets and UWB devices.

**3. The Commission incorrectly assumed that interference to PCS handsets could be remedied by increasing their separation from the UWB device.**

The Commission dismissed potential PCS interference concerns by concluding that “[a]ny interference at close distances can be easily remedied by moving the devices a short distance apart;” and thus, such interference should not be taken into account.<sup>20/</sup> As Sprint, Sirius, and others demonstrate, this superficially simple solution would be ineffective in protecting PCS (and satellite radio) operations from interference.<sup>21/</sup>

First, users most likely will not be aware that any interference that arises is caused by a UWB device. Instead, they will blame the interference on problems with the service.<sup>22/</sup> AWS devotes substantial time, effort and resources to continuously improve the quality and clarity of its service, and the Commission should support those efforts, not jeopardize their effectiveness by implementing policies that cause users to falsely perceive service quality issues.<sup>23/</sup>

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<sup>20/</sup> *Id.* ¶ 159.

<sup>21/</sup> See Sprint at 18-19; Sirius at 12-15. Further, even if this approach were workable, it improperly shifts the burden of resolving interference to PCS users, in violation of the Commission's rules. See Section I.B, *infra*.

<sup>22/</sup> See, e.g., Sprint at 18; Sirius at 13. Contrary to Sirius' assertions, PCS customers are neither accustomed or resigned to interference with their wireless service. Sirius at 21.

<sup>23/</sup> See *Revision of Part 15 of the Rules Regarding the Operation of Radio Frequency Devices Without an Individual License*, 4 FCC Rcd 3493, ¶ 17 (1989) (where “Part 15 devices have the potential to contribute to the undesired emissions that interfere with the satisfactory

Second, even if a wireless subscriber recognizes that some other device is causing interference to his or her service, the subscriber most likely will not know what device is causing it or where the device is located, making efforts to increase their separation virtually impossible.

Third, increasing the separation distance is often not possible or practicable. Wireless phones are often used in locations -- such as a car -- where the subscriber is unable to move any meaningful distance in any direction.<sup>24/</sup> Further, it may be very difficult to move away from a UWB device if they are as ubiquitous as has been suggested.<sup>25/</sup> In the above office cubicle hypothetical, for example, employees would have to leave the office in order to attain the required “separation.” An approach based on sending employees out of the building every time they need to make a telephone call is clearly unworkable. In short, given that there are currently nearly 140 million commercial radio users in the United States, and given the portable nature of UWB devices and the Commission’s expectation that UWB use will be widespread, a regulatory “fix” based on increasing the separation distance is simply not feasible.

Even if moving away from an interfering device were possible, this approach would not solve the larger problems of loss of network coverage that UWB devices cause.<sup>26/</sup> AWS estimates that UWB operations in a given PCS cell could decrease the

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operation of authorized and recognized radio services,” it is the Commission’s duty to “adopt[] technical standards that . . . will minimize the probability that harmful interference will be caused to authorized radio services . . .”).

<sup>24/</sup> See Sirius at 14.

<sup>25/</sup> See, e.g., Sprint at 18 (“if UWB proponents are correct that offices and homes will be flooded with UWB devices, then a PCS customer’s ability to get sufficiently far away from a UWB device may be difficult if not impossible”).

<sup>26/</sup> See Sprint at 10-14.

coverage of that cell by approximately 8-9 percent, assuming a 1 dB degradation in basestation receiver sensitivity caused by interference from UWB devices. At the edges of the coverage area, PCS terminals will be increasingly unable to overcome interference from UWB devices and transmissions from the terminal to the basestation will degrade to the point at which calls can no longer be made, causing the coverage area to effectively shrink. This effect will be magnified, and the effective coverage area further reduced, if several UWB devices are being used in close proximity to the PCS terminal or basestation.<sup>27/</sup> The Commission's rules must be revised both to remove dependence on the possibility of increased separation distances, and to account for the impact on PCS network coverage caused by UWB emissions.

**4. The Commission incorrectly assumed that interference to PCS handsets could be remedied by coordinating their use with UWB devices.**

The Commission's suggestion that certain acknowledged interference -- such as that arising from surveillance devices -- can be "readily identified and corrected"<sup>28/</sup> by coordinating with the UWB device user reflects a clear lack of understanding of the coordination process and is completely impracticable for PCS users.

As discussed above, the average PCS user would have no idea how to identify and locate the UWB device for purposes of coordination. Additionally, the nature of the UWB signal and its short pulse duration make it very difficult to trace or analyze interference and identify it as coming from a UWB device, a problem that will be

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<sup>27/</sup> See also Section II, *infra*.

<sup>28/</sup> First Report and Order ¶ 55.

worsened because the devices are unlicensed and thus there is no way to identify their users.

More importantly, however, coordination -- a technical process that ordinarily requires adjusting power levels, antenna configuration, or other steps to allow for simultaneous use of spectrum -- is a difficult and time-consuming process that makes no sense when applied to individual users. Coordination generally assumes potential interference will occur between two licensees whose operations will continue to have to coexist (geographically or in the spectrum) for some period of time.<sup>29/</sup> While this process generally is achievable when one licensee is the Government, because there is a single point of control, it is completely unworkable as applied to PCS. Because PCS and UWB devices will be ubiquitous and mobile and UWB devices will not be under the control of a single entity, UWB interference will be sporadic and thus very hard to predict and protect against through coordination. Thus, while it might be theoretically possible for a network operator to coordinate with a limited number of UWB installations, coordination of UWB devices with PCS terminals would be well beyond the abilities of PCS subscribers (and many UWB device users as well).

Finally, it is nonsensical for the Commission to suggest coordination as a solution to interference with PCS operations, because as Cingular and others observe, even where the Commission provided for a coordination process to protect licensed operations, it did not extend those protections to non-government licensees.<sup>30/</sup>

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<sup>29/</sup> See *id.*

<sup>30/</sup> See Cingular at 21-24.

**5. The Commission incorrectly assumed that indoor emissions limits in the cellular and PCS bands could be more lenient than those established for other bands or for outdoor UWB device use.**

The Commission without explanation established emissions levels for UWB devices operating indoors in the PCS and cellular bands that are both less stringent than those established for the GPS band and less stringent than those established for outdoor use. As Sprint and others observe, the Commission's entire explanation of the limits it established for emissions in the cellular and PCS bands was limited to the statements that "12 dB of attenuation below the Part 15 general emissions limits appears more than sufficient to provide this protection [to PCS];"<sup>31/</sup> that "given that we are applying a reduction of at least 12 dB in emissions in the GPS frequency band, which is in close proximity to the PCS band, in an abundance of caution we require this reduction to extend through the PCS band to 1990 MHz;"<sup>32/</sup> and that "[w]e do not believe that additional attenuation is needed for UWB emissions falling in the Cellular Radiotelephone Service bands at 824-849 MHz and 869-894 MHz bands."<sup>33/</sup>

In fact, however, the Commission's GPS protections were not extended to PCS or cellular: GPS bands were protected by a total of 34 dB of attenuation, while the PCS and cellular bands received only 12 dB of protection. Given that, as the Commission

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<sup>31/</sup> *First Report and Order* ¶¶ 192-93. Again, while AWS focuses in this pleading on the need for additional protection in the PCS band, it agrees with Sprint's argument that the Commission's procedural failure to explain how the limits were established is itself a reason to void the current rules. *See* Sprint at 15-16.

<sup>32/</sup> *First Report and Order* ¶ 163.

<sup>33/</sup> *Id.* ¶ 192.

recognized, the PCS band is in “close proximity” to the GPS band,<sup>34/</sup> the two bands need similar protection to avoid the possibility of harmful interference.

The limits for emissions in the cellular and PCS bands are also irrational because they provide less protection from indoor devices than they do from outdoor devices -- completely the reverse of what is needed. As Sprint explains, PCS and cellular operations require additional protection indoors because customers indoors already experience signal loss caused by building walls and windows.<sup>35/</sup> Even though the Commission recognized that the limits should be adjusted for the negative impact of building attenuation on GPS signals indoors,<sup>36/</sup> it inexplicably failed to provide any similar protection for PCS or cellular. AWS agrees with Sprint that the Commission should revise the level for indoor UWB applications to be 5 dB below the limit set for outdoor emissions.<sup>37/</sup> Further, the Commission should reject Kohler’s request to raise the emission limit for indoor devices.<sup>38/</sup> Kohler’s analysis concluding that its request would not raise the risk of interference is focused solely on potential interference to Federal systems outside buildings, and completely fails to take into account the potential interference inside the building to PCS and cellular operations.<sup>39/</sup>

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<sup>34/</sup> *Id.* ¶ 163.

<sup>35/</sup> *See* Sprint at 16-17.

<sup>36/</sup> *See First Report and Order* ¶¶ 66, 99.

<sup>37/</sup> *See* Sprint at 16-17.

<sup>38/</sup> Kohler at 2-4.

<sup>39/</sup> *See id.* at 2

**B. The UWB Limits Were Set Based On an Incorrect Interpretation of the Purpose and Scope of Part 15.**

The Commission's factual errors behind the UWB limits are compounded by the incorrect legal assumptions that went into the Commission's decisionmaking. First, the Commission failed to appreciate the restricted nature of Part 15 operations. The *First Report and Order* is replete with statements reflecting the Commission's misguided belief that Part 15 is meant to encourage the unlimited "sharing" of spectrum, rather than the more limited use that Part 15 actually permits.<sup>40/</sup> In fact, Part 15 is designed to allow *only* operations that pose no significant risk of harmful interference to licensed operations,<sup>41/</sup> and gives licensed spectrum users clear priority over operations carried out under Part 15.<sup>42/</sup> While the Commission has rejected the view that Part 15 allows simultaneous use of spectrum only where there is "*no* interference potential to licensed services" as "overly conservative," it has emphasized that "[t]he operating requirements

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<sup>40/</sup> *First Report and Order* ¶ 17.

<sup>41/</sup> See, e.g., *Review of Part 15 and other Parts of the Commission's Rules*, ET Docket No. 01-278, *First Report and Order*, FCC 02-211 (rel. July 19, 2002) (requiring certain radar detectors that cause interference to authorized services to minimize the possibility of interference); *Amendment of Part 15 of the Commission's Rules to Allow Certification of Equipment in the 24.05 - 24.25 GHz Band at Field Strengths up to 2500 mV/m*, 16 FCC Rcd 22337, ¶ 1 (2001) (authorizing the operation of fixed point-to-point transmitters only if they "use highly directional antennas to minimize the possibility of creating harmful interference to other services in the band").

<sup>42/</sup> See, e.g., *Auction No. 43, Multi-Radio Service Auction Scheduled for January 10, 2002; Notice and Filing Requirements, Minimum Opening Bids, Upfront Payments and Other Procedural Issues*, 16 FCC Rcd 17793 (2001) (operations by users of Part 15 devices are "secondary"); *Amendment of Parts 2 and 90 of the Commission's Rules to Allocate the 5.850-5.925 GHz Band to the Mobile Service for Dedicated Short Range Communications of Intelligent Transportation Services*, 13 FCC Rcd 14321 ¶¶ 5, 24 (1998) (same); *Amendment of Parts 2 and 15 of the Commission's Rules Regarding Spread Spectrum Transmitters*, 12 FCC Rcd 7488, ¶ 17 (1997) ("Part 15 devices are secondary to all other radio operations").

of Part 15 appropriately provide a means for allowing unlicensed devices to share spectrum with licensed services with *little* risk of interference to licensed services.”<sup>43/</sup>

Using the Commission’s own standard, it cannot under Part 15 authorize UWB emissions in licensed spectrum that will require licensed spectrum users to engage in extensive efforts -- whether moving away from Part 15 devices, engaging in difficult “coordination” efforts or constructing new systems<sup>44/</sup> -- so that their services can continue to function. None of these activities suggests that the UWB emissions levels were set so as to pose “little risk” of interference. Indeed, the mere suggestion of coordination -- a procedure designed to resolve spectrum use conflicts between services with equal priority -- is completely antithetical to the limited purpose and scope of Part 15, which requires Part 15 users to *cease* operations when causing harmful interference to licensed operations,<sup>45/</sup> and such a requirement would seriously undermine the rights of licensees. The Commission, however, completely ignored these limitations.

Indeed, as Cingular observes, many of the Commission’s statements suggest that the Commission was engaged in result-oriented decisionmaking aimed at enabling UWB deployment and was less concerned with the restrictions of Part 15 operations designed to protect licensed users.<sup>46/</sup> For example, the Commission’s discussion of the appropriate emissions limits for UWB imaging systems specifically acknowledges that certain UWB

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<sup>43/</sup> *Amendment of Part 15 of the Commission's Rules to Allow Certification of Equipment in the 24.05 - 24.25 GHz Band at Field Strengths up to 2500 mV/m*, 16 FCC Rcd 22337 at ¶ 12 (emphasis added).

<sup>44/</sup> See Section I.C.2, *infra*.

<sup>45/</sup> 47 C.F.R. § 15.5(c).

<sup>46/</sup> See Cingular at 14; see also, e.g., *First Report and Order* ¶ 33 (limits were established “[t]o realize the full benefits of [UWB] technology” by “establish[ing] as few restrictions as possible on UWB operating frequencies.”). The phrase “except as necessary to protect existing

systems that do not direct their energy at the ground present a higher risk of interference than other authorized devices, but concludes that such interference should nonetheless be accepted because “it is desirable for these imaging systems to operate across a broad range of frequencies in order to accommodate different applications.”<sup>47/</sup> The “desirability” of the Part 15 device, however, is irrelevant to its authorization under Part 15, which requires the Commission to engage not in a balancing of interests, but rather a limited evaluation of whether the device can function without causing harmful interference to existing operations.<sup>48/</sup>

Second, in considering the record evidence, the Commission misapplied the burden of proof. Rather than requiring those seeking to use spectrum under Part 15 to demonstrate lack of interference with existing operations, as required by the Commission’s rules,<sup>49/</sup> it required licensed spectrum holders to demonstrate a likelihood of interference.<sup>50/</sup> Requiring such a showing, however, is completely inconsistent both with the Commission’s rules, which are premised on the notion that Part 15 operations are meant to be clearly secondary to licensed operations, and with existing precedent.<sup>51/</sup>

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services against interference,” *id.*, seems to arrive as an afterthought, rather than as the driving consideration that Part 15 compels.

<sup>47/</sup> *First Report and Order* ¶ 49.

<sup>48/</sup> *See* 47 C.F.R. § 15.5 and nn.41, 42, *supra*.

<sup>49/</sup> *See AIRCELL, INC.; Petition, Pursuant to Section 7 of the Act, For a Waiver of the Airborne Cellular Rule, Or, in the Alternative, for a Declaratory Ruling*, 15 FCC Rcd 9622, ¶ 18 (2000) (secondary spectrum users must make an affirmative showing that their proposed operations are not likely to cause harmful interference to existing operations).

<sup>50/</sup> *See* Sprint at 12-13; Sirius at 12-13.

<sup>51/</sup> *See id.* (discussing applicable case law).

**C. Even if the Commission Does Not Revise the UWB Emissions Limits, It Should Implement Additional Protections for Existing Spectrum Users.**

If the Commission nonetheless retains the existing UWB emissions limits, it should minimize the potential for and possible harm from interference as much as possible. Two important means of accomplishing this goal are to (1) deny requests to expand the list of authorized UWB users and remove broad categories of users such as “industrial entities;” and (2) confirm that UWB users will have the responsibility of mitigating the interference to cellular and PCS operations that will inevitably result or cease operations in the cellular and PCS bands.

**1. The Commission should narrow the list of authorized users of surveillance systems.**

The Commission states that where certain UWB devices pose a higher risk of interference but are important to public safety, it will allow the public safety uses of the device, but restrict its use by the general public.<sup>52/</sup> Despite this assertion, however, the rules adopted by the FCC still permit widespread use of UWB devices. The list of “authorized” users of surveillance systems in particular is so broad as to include virtually anyone. The Commission “limits” such use to “law enforcement, fire and emergency rescue organizations, public utilities, and industrial entities.”<sup>53/</sup> Further, the Order clarifies that “public utilities” and “industrial entities” mean any manufacturers licensee, petroleum licensee or power licensee defined in Part 90, which itself sets forth long lists of eligible persons under those categories.<sup>54/</sup>

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<sup>52/</sup> *First Report and Order* ¶ 21.

<sup>53/</sup> *Id.*

<sup>54/</sup> *See* 47 C.F.R. § 90.7.

AWS does not object to any use of UWB for fire, emergency, rescue or other true public safety purposes. However, the Commission has expanded the notion of “public safety” to include virtually anyone that might use the device in any manner that vaguely relates to the public interest. Further, numerous petitions for reconsideration include “me too” requests that those lists be expanded even further, to include such entities as any private companies that own or use UWB devices currently, or any federal, state or local transportation department.<sup>55/</sup> Indeed, the GPR Service Providers Coalition advocates a rule for operation of GPR devices that would include anyone except “consumers, hobbyists and other casual users.”<sup>56/</sup> Such requests should be denied, and the Commission should revise its rules concerning authorized users to authorize use of surveillance systems only for true public safety purposes.

**2. The Commission should confirm that UWB manufacturers have the burden of mitigating interference from UWB devices.**

If the Commission does not revise the limits for permissible emissions in the PCS band, AWS predicts that there will be numerous instances in which UWB operations cause interference to its licensed operations. In those situations, if the UWB manufacturer or user does not take steps to eliminate the harmful interference with AWS’ licensed spectrum use, then it must cease UWB operations in the service area, as required by the Commission’s rules.<sup>57/</sup>

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<sup>55/</sup> See, e.g., GPR Service Providers Coalition at 8-9.

<sup>56/</sup> GPR Service Providers Coalition at 9.

<sup>57/</sup> See 47 C.F.R. § 15.5; *Amendment of Part 15 of the Commission's Rules to Allow Certification of Equipment in the 24.05 - 24.25 GHz Band at Field Strengths up to 2500 mV/m*, 16 FCC Rcd 22337 at ¶ 12 (Part 15 devices causing interference to licensed operations must cease operation until the problem is corrected).

If the UWB manufacturer is unable to alter the UWB device to avoid interference with PCS and cellular operations, the Commission should confirm that the UWB manufacturer will bear the cost of any alterations to the PCS system necessary to mitigate the interference. Unfortunately, options for mitigating the inevitable interference are limited. Although increasing the power of PCS handset and/or basestation transmissions could theoretically solve most interference problems from UWB devices, this is not possible for several reasons, including the need to balance the link budget, limited battery life, legacy equipment, and the fact that systems would have to be totally redesigned to accommodate increased handset power. Further, power limitations to meet the relevant specific absorption rate (SAR) limits are also a consideration. Thus, the only workable solution to limit UWB interference would be to construct additional cell towers to compensate for the shrinkage in coverage area.

Constructing cell towers is both time-consuming and expensive. Towers can cost \$250,000-\$300,000 each. Further, obtaining permission to use the rights-of-way or property to locate the tower is an arduous, expensive, and time-consuming process. AWS and other service providers should not be forced to bear costs incurred to mitigate UWB interference. The Commission should confirm, therefore, that if UWB emissions in the PCS band causes interference that require AWS and other service providers to construct additional cell towers, the costs of the additional construction must be borne by the UWB industry.<sup>58/</sup>

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<sup>58/</sup> See, e.g., *Amendment of Parts 15 and 90 of the Commission's Rules to Provide Additional Frequencies for Cordless Telephones*, 10 FCC Rcd 5622, ¶ 16 (1995) (authorizing certain cordless telephone operations only on the understanding that cordless telephone users will be responsible for eliminating any interference that might result from the operation of cordless telephones).

## **II. THE ORDER FAILS TO ACCOUNT FULLY FOR THE INCREASED INTERFERENCE CAUSED BY THE AGGREGATE EFFECTS OF MULTIPLE UWB DEVICES**

Although the Commission recognized that multiple UWB devices can present a greater risk of harmful interference than a single UWB device and that indoor PCS operations are at particular risk of such interference,<sup>59/</sup> it failed to provide adequate protection from that interference for existing cellular and PCS operations. Because, as discussed above, UWB devices cause a decrease in the coverage of the wireless network, the harmful effect of multiple UWB devices is most likely to be experienced at the “edges” of coverage -- in alleys between large buildings, in large buildings’ inner hallways, in elevators, or near the border of the service area. The Commission’s analysis, however, fails to take this factor into account when evaluating the risk of aggregate interference to cellular and PCS operations.

As Sprint observes, the Commission’s failure to provide the necessary protection is particularly egregious given that the Order establishes extra protection in the GPS band in order to protect against the cumulative effect of interference, and given the Commission’s own recognition that UWB devices are likely to abound in the home, car and office in the near future.<sup>60/</sup> AWS agrees with Sprint that the Commission should modify the rules to add an additional 6 dB of protection to the indoor and outdoor UWB emissions levels in the PCS and cellular bands to protect against the harmful effects of aggregate UWB interference.

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<sup>59/</sup> *First Report and Order* ¶¶ 233-34.

<sup>60/</sup> *See Sprint* at 28.

### III. THE COMMISSION SHOULD ALLOW INTERESTED PARTIES TO PARTICIPATE IN FUTURE TESTING OF UWB INTERFERENCE

AWS agrees with Sprint and others that real world testing of UWB devices is necessary to determine the extent of interference that various UWB devices will cause to existing licensed PCS and cellular operations.<sup>61/</sup> As Sprint and others note, however, UWB manufacturers thus far have refused to make their devices available for testing.<sup>62/</sup> It is imperative that such tests be conducted, and that all interested parties -- particularly those licensees that are most likely to encounter UWB interference to their operations -- be allowed to participate fully in the design and implementation of the testing process. The faulty assumptions made in the *First Report and Order* -- for example, those concerning what power levels cellular and PCS systems “really” use -- demonstrate the importance of obtaining the benefit of the experience and expertise of industry in order to obtain meaningful and valuable test results. Further, it is a basic principle of administrative law that the Commission cannot rely as a basis of its rules on the results of tests carried out without public participation.<sup>63/</sup>

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<sup>61/</sup> See Sprint at 36-39; Aeronautical Radio Inc. at 6-8.

<sup>62/</sup> See, e.g., Sprint at 36-39.

<sup>63/</sup> See, e.g., *Action for Children's Television v. FCC*, 564 F.2d 458, 470-71 (D.C. Cir. 1977) (public participation must be “meaningful”); *National Family Planning and Reproductive Health Ass'n, Inc. v. Sullivan*, 979 F.2d 227, 241-42 (D.C. Cir. 1992) (public participation particularly crucial in situations where existing rules may change, since it is very likely to “provide the agency with greater information from which it can make the most reasoned decision”); *Solite Corp. v. EPA*, 952 F.2d 473, 484 (D.C. Cir. 1991) (“Integral to the notice requirement is the agency's duty to identify and make available technical studies and data that it has employed in reaching the decisions to propose particular rules”); *Connecticut Light and Power Co. v. NRC*, 673 F.2d 525, 530-31 (D.C. Cir. 1982), cert. denied, 459 U.S. 835 (1982) (“An agency commits serious procedural error when it fails to reveal portions of the technical basis for a proposed rule in time to allow for meaningful commentary”).

## CONCLUSION

For the reasons described above, AWS supports the petitions for reconsideration of Sprint, Qualcomm and others for the Commission to revise its rules as described to protect existing licensed PCS and cellular operations, and opposes the petitions of Time Domain, Kohler and others to allow for additional UWB device operators or additional UWB emissions in the PCS and cellular bands.

Respectfully submitted,

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## **CERTIFICATE OF SERVICE**

I, Angela Collins, hereby certify that on the 31st day of July 2002, I caused copies of the foregoing "Comments of AT&T Wireless Services, Inc. on Petitions for Reconsideration" to be sent to the following by either first class mail, postage pre-paid, or via e-mail(\*) to the following:

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